Name: Date:

Polynomial Factoring solution (version 10)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 2x + 21 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(21)}}{2(1)}$$

$$x = \frac{-(2) \pm \sqrt{4 - 84}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-80}}{2}$$

$$x = \frac{-2 \pm \sqrt{-16 \cdot 5}}{2}$$

$$x = \frac{-2 \pm 4\sqrt{5}\, i}{2}$$

$$x = -1 \pm 2\sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-6 + 2i$ and $-5 + 3i$ in standard form $(a + bi)$.**

Solution

$$(-6 + 2i) \cdot (-5 + 3i)$$

$$30 - 18i - 10i + 6i^2$$

$$30 - 18i - 10i - 6$$

$$30 - 6 - 18i - 10i$$

$$24 - 28i$$

Polynomial Factoring solution (version 10)

3. **Write function $f(x) = x^3 + x^2 - 26x + 24$ in factored form. I'll give you a hint: one factor is $(x + 6)$.**

Solution

	1	1	-26	24
-6		-6	30	-24
	1	-5	4	0

$$f(x) = (x+6)(x^2 - 5x + 4)$$

$$f(x) = (x+6)(x-1)(x-4)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+6) \cdot (x+3) \cdot (x-1) \cdot (x-4)^2$$

Sketch a graph of polynomial $y = p(x)$.